

REMARKS

The Examiner is thanked for careful examination of the application. In view of the Office Action, several claims have been amended in order to render the claims in condition for allowance. In addition, a new Figure 13 is submitted.

In view of the foregoing amendments and the remarks that follow, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections.

Drawings:

In response to the Official Action, Figure 13 has been revised so that the diameter of the rollers are proportional to the data set out on page 22 of the specification. In the revised Figure 13, the trumpet shape, described in the claims as each of the sets of guide rollers defining a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying, is clearly illustrated. No new matter is included in Figure 13, because the roller diameters are proportional to the data on page 22.

Accordingly, the Examiner is respectfully requested to withdraw the objection to the drawings.

Claim and Specification Objections:

In response to the claim and specification objections, the identified claims have been reviewed and carefully amended to avoid the issues raised by the Office Action. Specifically, the language "continuously increasing" has been removed from the claims.

In addition, the language concerning the "shallower angle of inclination" has been removed and replaced with language that is more specific. The claims now define that the pipeline is less vertical as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement. This language is now included in every independent claim.

Accordingly, the Examiner is respectfully urged to reconsider and withdraw the outstanding objections to the claims and specification.

Art Rejections:

Claims 22-29, 36-40, 42-43, and 45-47 have been rejected under 35 U.S.C. §103(a) as being unpatentable over DE 2118360, hereinafter *Nolan*, in view of GB 1107541, hereinafter *Shell*, and U.S. Patent No. 4,986,697, hereinafter *Lynch*.

Claims 22-29, 36-40, 42-43, and 45-47 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Nolan*, in view U.S. Patent No. 3,668,878, hereinafter *Jones*.

One of the objects of the present invention is to reduce the over stressing of pipelines when using a J-laying technique, as opposed to S-laying. The Examiner's attention is directed to the first two pages of the application, wherein the differences between S-laying and J-laying are carefully explained. In brief summary, in S-laying, as the pipe leaves the vessel, the pipe curves downwardly off the stern of the vessel, toward the seabed, and then curves in the opposite direction at the bottom, thus forming an S shape.

If the water is too deep, it is preferred to use J-laying techniques, wherein the pipe leaves the vessel at a much steeper angle, sometimes close to vertical. At the bottom, the pipe then curves away from the vessel, thus forming a J shape. In conventional J-laying, the pipe has a shape of a J, and is therefore curved towards the bottom, but is straight towards the top. Thus, the pipe flows down the tower of the vessel along a straight path, whereas in S-laying, it is inevitable that the pipe will seek to assume a steeper angle of inclination immediately upon exiting the tower, which does not apply when J-laying which is conventionally carried out in deep water. If the water is too shallow, the pipeline may become over-stressed in a J-laying process if there is not enough room for the pipe to curve.

One of the objects of the present invention is to reduce the stress on pipelines when laid with a J-laying process, especially in shallow water. The invention enables a more effective use of J-laying in a wider range of conditions, including in shallow water. See page 2, lines 17-21 of the specification.

The present invention is based, at least in part, upon the appreciation that it may sometimes be desirable to J-lay in relatively shallow water, and it may then be desirable not to have any truly straight length of pipe, but rather to begin curvature of the pipe immediately below the tower and even within the tower. This idea of J-laying with a pipe curving within the length of the tower is not taught or suggested in the prior art. As now set forth in each of the independent claims, the pipeline undergoes some bending so that the pipeline is *less vertical* as the pipeline passes through the lower guide arrangement than when the pipeline passes through the tower assembly upstream of the lower guide arrangement.

Each of the art rejections relies on the primary reference *Nolan*. In direct contrast to the new language in the claims, in *Nolan*, the pipeline assumes a more vertical orientation as it passes through the lower portion of the tower. See Figures 12A through 12D.

Accordingly, all of the rejections based on *Nolan* should be withdrawn.

In addition to the distinction described above concerning the vertical orientation of the pipeline, there are other features of the present invention set forth in one or more of the various claims which distinguish the present invention from the prior art.

Trumpet-shaped lower guide arrangement:

The Examiner's attention is directed to claim 45 and new claims 48 – 52, which has been amended or added so that the lower guide arrangement is now defined as including a plurality of sets of guide rollers spaced apart along the path of the pipeline and defining the lateral limits of the path, and each of the sets of guide rollers defines a respective set diameter and the set diameters increase nonlinearly in the direction of travel of the pipeline during laying. See new Figure 13. With regard to that feature, the Examiner relies upon Figures 3 and 12a-12d of *Nolan*. However, in *Nolan*, the outward flaring increases linearly with regard to the distance that the pipe travels, whereas the claims of the present application which relate to the above described feature wherein the set diameters increase nonlinearly in the direction of travel of the pipeline during laying.

Accordingly, the prior art does not teach or suggest the shape of the lower guide arrangement, as now set forth in the claims. Support for the amendment can

be found in original claim 5 and in the table on page 22 of the specification. This feature enables a less stressful transition of the pipeline into the sea than in the prior art.

The new claims 48 – 52 are dependent claims and are thus patentable at least for the reasons set forth above with respect to the independent claims from which they depend.

In view of the foregoing amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections.

In the event that there are any questions concerning this response, or the application in general, the Examiner is respectfully urged to telephone the undersigned attorney so that prosecution of the application may be expedited.

Respectfully submitted,

BUCHANAN INGERSOLL PC

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By: William C. Rowland
William C. Rowland
Registration No. 30,888

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620